URBAN LAND SUITABILITIES

The 1989 Comprehensive Plan adopted a creative approach for determining the suitability of land for urban development, and recognized that the physical characteristics of the land allow it to "speak for itself." For instance, it is evident that for commercial development, flat land works better and produces more useable area for development than steeply sloped land. Similarly, the lot yield in a residential subdivision is limited by the presence of steep slopes and wetlands. Thus, the physical planning process should recognize the fact that physical characteristics significantly impact the development potential of the land, and future land use recommendations should be made with these considerations in mind. The analysis of these physical parameters were incorporated into the Zoning Ordinance in 1991, continued with the 1998, 2006 and 2013 Plans, and have been used as an important part of the future land use evaluation process for the 2020 Plan. These considerations include the following factors:

- Slopes in the 10-20% are generally suitable for urban uses and infrastructure.
- Slopes in the 20-30% range begin to restrict the urban development potentials of individual parcels.
- Slopes greater than 30% pose significant constraints for urban development and should not be used for construction unless specific waivers are granted.
- Areas of significant archaeological and geologic features should be avoided to the extent possible.
- Floodplains, tributary streams, tidal marshes, wetlands and major drainage channels are needed to maintain hydrologic equilibrium in the watershed and development of these areas should be avoided, and the development of adjacent areas should be allowed only under close scrutiny.
- Significant and/or rare vegetative cover is an important part of the natural environment, and should be respected as vacant land is developed.
- Future land uses adjoining developed areas must respect their architectural scale, density and character.
- Land areas identified as necessary to accommodate public facilities, utilities and related infrastructure should be reserved.
- Construction should be prohibited on land identified by the Zoning Ordinance as Chesapeake Bay Resource Protection Areas, and development on land identified as Chesapeake Bay Resource Management Areas should incorporate sufficient water quality management features to meet the standards described by Virginia's Chesapeake Bay Preservation Act and Virginia Stormwater Management Act and corresponding regulations.

By applying these parameters to the land that is available for development and redevelopment, conclusions can be drawn for the suitability of the land, the most appropriate uses, the location of "sensitive environmental areas" on which development should be restricted, and the location of land which should be reserved for public facilities and infrastructure improvements.

When looking specifically at residential land, the concept of "net developable acreage," as introduced in the 1989 Plan, provides a rational approach for estimating its development potential. The "net developable acreage" methodology, based on slope and environmental analysis, allows for a better estimate of a given

property's development capacity. For example, an area with a gross acreage of 100 acres, but having 20 net acres of land which have been identified as "sensitive environmental areas," would yield 80 "net developable acres". When the "net developable area" concept is used in conjunction with site planning for individual development projects, the zoning district regulations will, in effect, combine conventional zoning standards with environmental performance standards. The end result is an implementation process which is responsive to the physical characteristics of the land.

Insert Picture

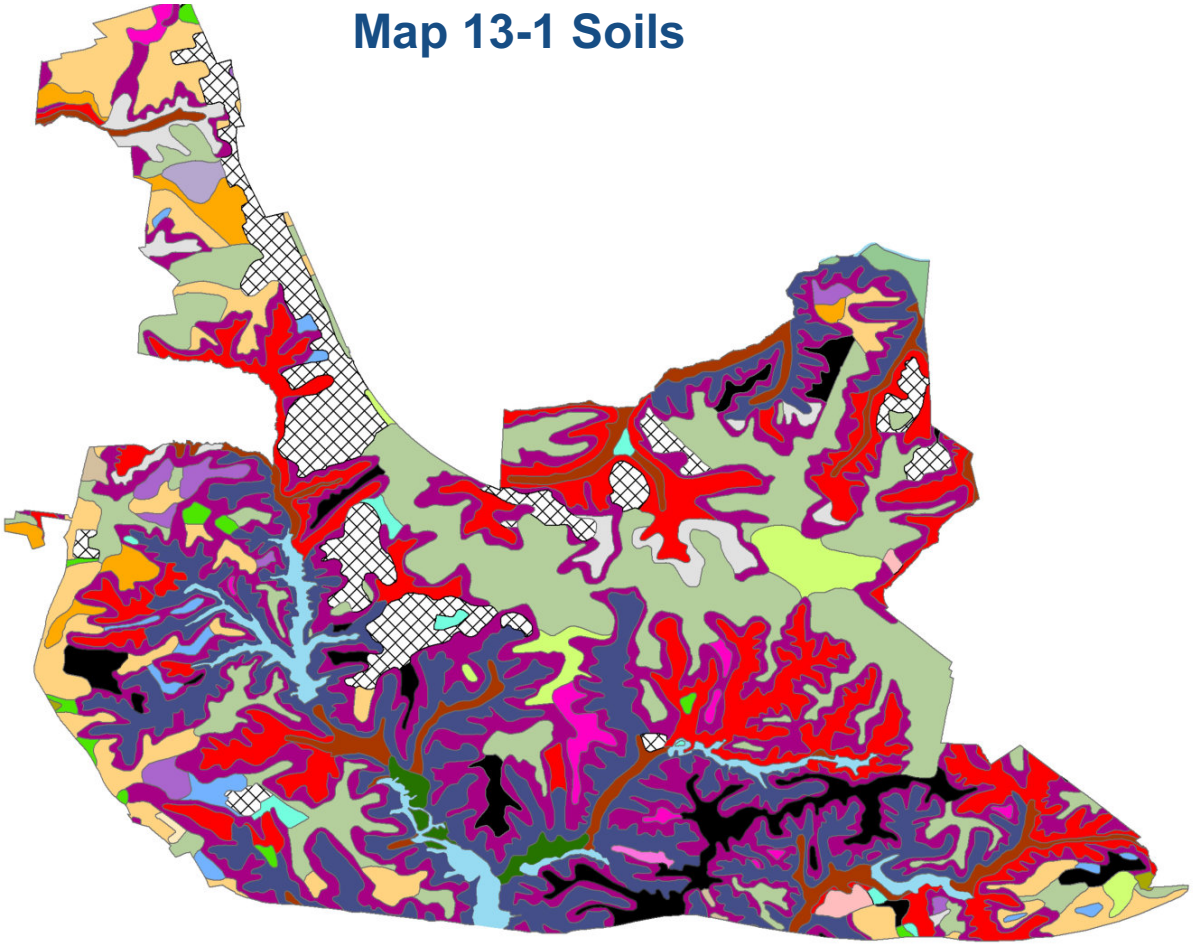
Soils

The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service in cooperation with Virginia Polytechnic Institute and State University prepared soil surveys for Tidewater, Virginia. Williamsburg is included with the surveys of James City and York Counties and the City of Williamsburg.

The major soil associations in Williamsburg defined in the soil survey are:

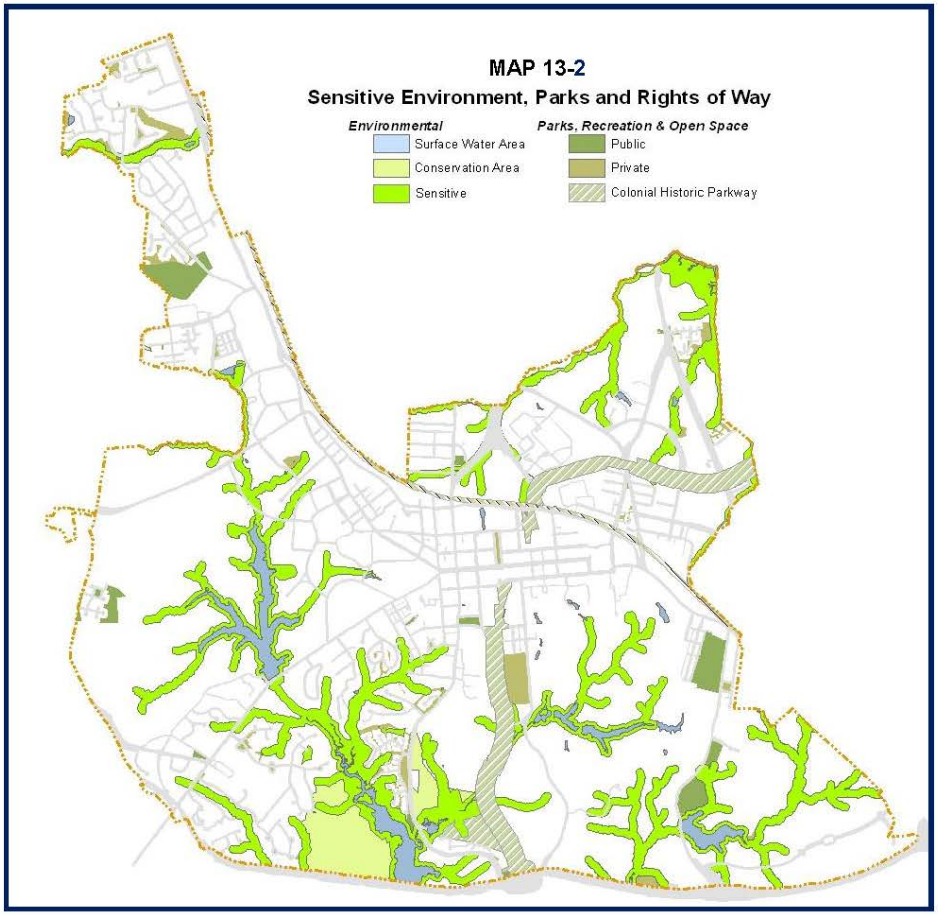
- Slagle-Emporia-Uchee are described as deep, moderately well drained and well drained soils that dominantly are loamy and are gently sloping to very steep; on uplands.
- Emporia-Craven-Uchee are deep, well drained and moderately well drained soils that dominantly are loamy or clayey and are gently sloping to very steep; on upland ridges and side slopes.
- Peawick-Emporia-Levy are deep, moderately well drained, well drained, and very poorly drained soils that dominantly clayey or loamy and are nearly level to very steep; on high terraces, escarpments, and side slopes and in freshwater marshes.

Map 13-1 Soils



muname

- Bethera silt loam
- Bohicket muck
- Caroline fine sandy loam, 2 to 6 percent slopes
- Craven fine sandy loam, 2 to 6 percent slopes
- Craven-Uchee complex, 2 to 6 percent slopes
- Craven-Uchee complex, 6 to 10 percent slopes
- Emporia complex, 10 to 15 percent slopes
- Emporia complex, 15 to 25 percent slopes
- Emporia complex, 25 to 50 percent slopes
- Emporia fine sandy loam, 2 to 6 percent slopes
- Izagora loam
- Johnston complex
- Kempsville fine sandy loam, 2 to 6 percent slopes
- Kempsville-Emporia fine sandy loams, 2 to 6 percent slc
- Kenansville loamy fine sand, 2 to 6 percent slopes
- Levy silty clay
- Slagle fine sandy loam, 0 to 2 percent slopes
- Slagle fine sandy loam, 2 to 6 percent slopes
- Suffolk fine sandy loam, 2 to 6 percent slopes
- Tomotley fine sandy loam
- Uchee loamy fine sand, 2 to 6 percent slopes
- Udorthents, loamy
- Udorthents-Dumps complex
- Urban land
- Water



OPEN SPACE

An important element of the City's character is its system of greenbelts and open spaces. These open space areas are generally depicted on the Future Land Use Map as "Sensitive Environmental Areas and Resource Protection Areas," "Parks, Parkway and Recreation," and "Greenbelts" as shown on Map13-2.

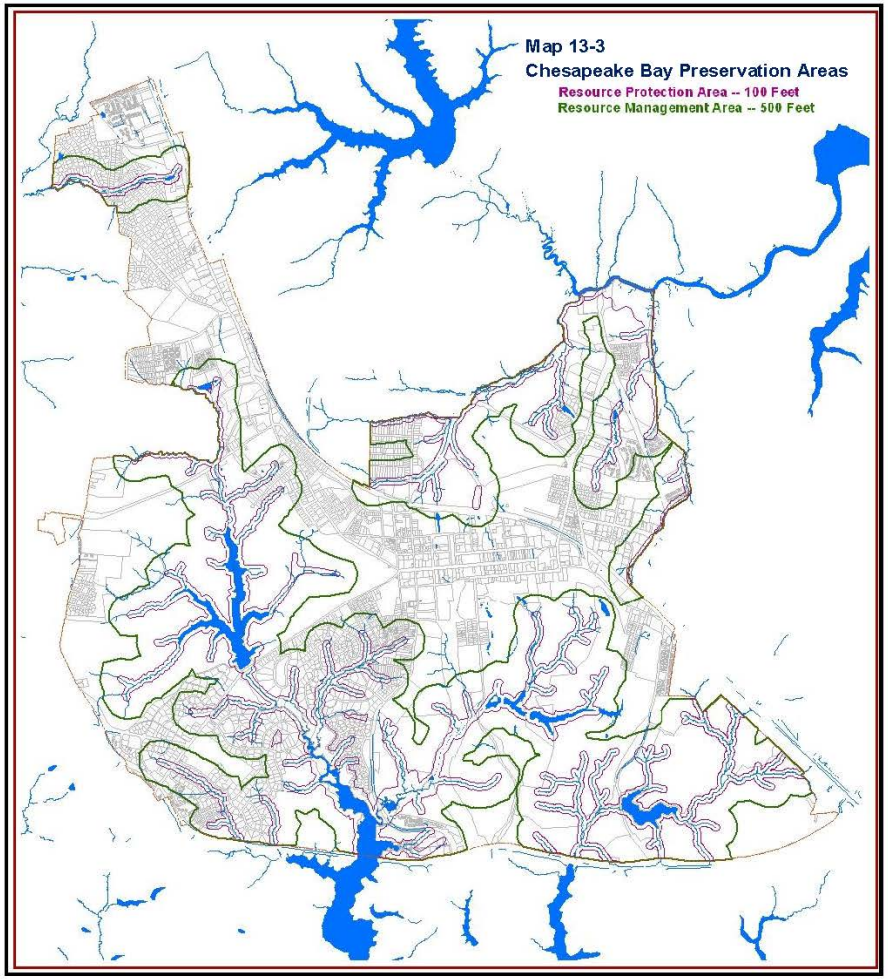
Insert Picture

Chesapeake Bay Regulations

A primary means of control of this open space is through the implementation of the City's Chesapeake Bay Preservation Districts. The City adopted its first Chesapeake Bay Ordinance on September 13, 1990 with updates in 2003 and 2013 to remain consistent with state regulations. The purpose of the regulations is to protect and improve the water quality of the Chesapeake Bay, its tributaries, buffer areas and other sensitive environmental lands by minimizing the potential adverse effects of human activity upon these areas. The Ordinance can be accessed through the Municode website in Williamsburg Municipal Code, Chapter 21, Article VIII. Chesapeake Bay Preservation.

As shown on Map 13-2 Chesapeake Bay Areas are designated in two categories. The RPA (Resource Protection Area) requires a 100 foot buffer from the edge of a wetland or shoreline, and this can result in major areas of open space around and through developments such as Holly Hills, Savannah Green, Quarterpath at Williamsburg (Riverside) and Queen Mary's Port. Approximately 16% of the City's land area is designated as Resource Protection Areas, and another 45% is designated as RMA (Resource Management Areas) - this comprises land within 500 feet of an RPA.

Another means of regulatory control is the requirement of maintaining a certain percentage of a site as landscaped open space. This is required in the City's multifamily residential and most of the non-residential zoning districts, and ranges from 15 to 50 percent. In addition, cluster subdivisions require that at least 25 percent of the gross land area of the subdivision be maintained as open space. These requirements can be further enhanced in those areas where greenbelts are mandated, as discussed later in this chapter.



Chesapeake Bay Preservation. It is important that future development not encroach on the natural stream valleys and other sensitive environmental areas that have been designated for conservation by the Comprehensive Plan. These sensitive environmental areas, shown on Map 13-3 are regulated by the Chesapeake Bay Preservation Ordinance and the City's site planning regulations. The Chesapeake Bay Preservation regulations, in place since 1990, are designed to protect and improve the water quality of the Chesapeake Bay, its tributaries, buffer areas and other sensitive environmental lands by minimizing the potential adverse effects of human activity upon these areas. The ordinance prohibits non-water-dependent development within identified resource protection areas. It also establishes performance standards for the development of land in preservation areas which are designed to establish the means to reduce areas of land disturbance, minimize erosion and sedimentation potential, reduce the land application of nutrients and toxins and maximize rainwater infiltration. ~~The standards are also intended to prevent a net increase in non-point source pollution from new development and to achieve a ten percent reduction in non-point source pollution from redevelopment.~~

Acquisition

The City should continue to actively investigate and pursue opportunities to acquire open space. There are several examples of the positive impacts of this program:

- The 1979 purchase of an additional 14 acres for Kiwanis Park.
- The 1987 purchase of the Minor's Store property at Capitol Landing Road and Page Street, jointly funded by the City and the Colonial Williamsburg Foundation. The store was demolished, and the property was landscaped to become Minor Park.
- The 1988 purchase of the College Woods property beside and behind Berkeley Middle School on Strawberry Plains Road. This property was formerly approved for a 130 lot single family subdivision. The rear 37 acres was exchanged with William & Mary and the remaining 13 acres is designated for development as Mixed Use land use.
- The 1996 purchase of the remaining 160 acres of the proposed Holly Hills subdivision. This allowed for the establishment of the 105 acre Richneck Conservation Area which ~~will be~~ is preserved for open space and utilized as part of the City's Chesapeake Bay preservation program, through its designation as Regional Reserved Open Space. This acquisition allowed the preservation of the viewshed from College Landing Park and from Route 199.
- The 1996 land exchange agreement with the College of William and Mary. The City received 37 acres on the east side of South Henry Street north of Papermill Creek, and the College received 37 acres behind Berkeley Middle

School as described above. This exchange allowed the College to further preserve the Lake Matoaka watershed, and will allow the City to develop a passive park on the north shore of Papermill Creek. Restrictive covenants were placed on both properties to preserve their use as passive open space.

- The 2006 acquisition through zoning proffers of 21.4 acres on Quarterpath Road for Redoubt Park. This park complements the development of the Quarterpath at Williamsburg mixed use development, and preserved important Civil War redoubts that were used for the defense of Williamsburg. An incentive for the donation of the land for Redoubt Park was the fact that the land area could still be used toward calculating the residential density for the development.

The City should continue the acquisition program with the highest priority placed on obtaining the Capitol Landing Park site and the College Creek nature area. The Capitol Landing site on the east side of Capitol Landing Road at Queen's Creek will allow the City to preserve the historic site of one of Williamsburg's colonial ports, and this land should become a passive park similar to College Landing Park, the City's other colonial port. The College Creek Nature Area, approximately 40 acres bounded by South Henry Street, Route 199 and College Creek, should be preserved as undeveloped open space to help South Henry Street retain its character as a scenic entrance corridor, but a small area adjacent to College Landing Park could be linked to the park through an extension of the existing marsh walk. The College Creek Nature Area and the contiguous lands of College Landing Park, Richneck Conservation Area, Papermill Creek Park (proposed) and Great Neck Picnic Area (closed) comprise 200 acres of passive open space, forming a major open space area in the southern section of Williamsburg.

A small, but important, parcel should be preserved as open space in the Municipal Center area. This one acre area between the First Baptist Church and the Crispus Attucks PUD was proposed as open space with the development of the Armistead Avenue PUD in 1974, but was not shown as open space in the 1989 and 1998 Comprehensive Plans. It should be designated as Parks, Parkway, Recreation land use on the Future Land Use Map, and remain as a passive open space.

INSTITUTIONAL PRESERVATION

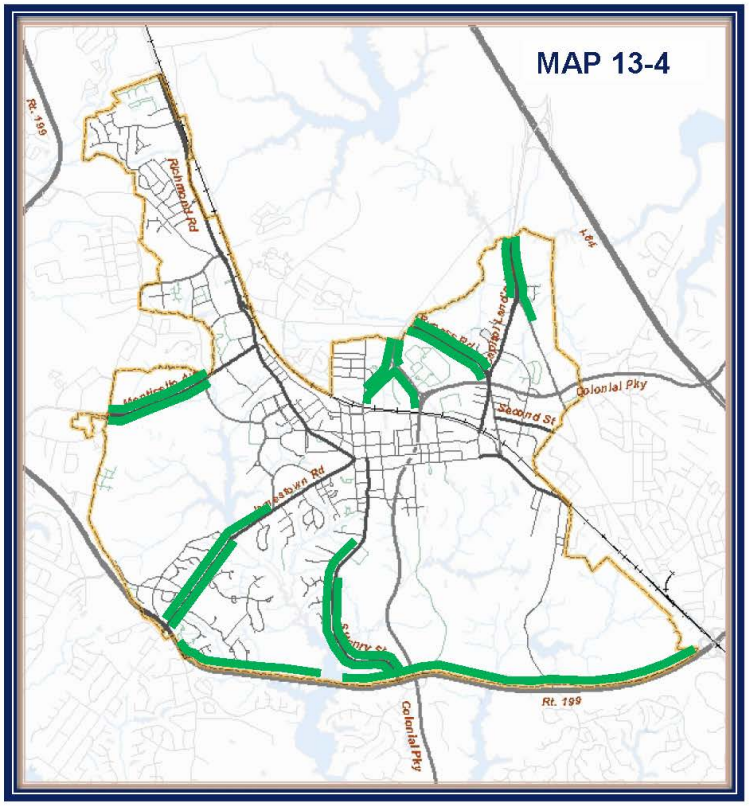
While the City's parks and parkways are essential elements of the open space system and are "protected" because of their public ownership, the preservation of land by the Colonial Williamsburg Foundation and the College of William and Mary greatly contribute to the quality of Williamsburg's environment. The Colonial Williamsburg Historic Area is the pre-eminent open space in the City, listed on the National Register of Historic Places, and expanded by 128 acres in 2002. The College of William and Mary designates substantial portions of its land for preservation, including the 245 acres of College Woods. This large area complements the landscaped grounds of the Main Campus. The College and the Colonial Williamsburg Foundation together provide the City with a quantity and quality of open space that is unmatched by any other City in the Commonwealth.

GREENBELTS

A successful recommendation of the last four Comprehensive Plans has been for the establishment of greenbelts. Designated greenbelts are intended to be left in an undisturbed natural state, unless modifications are approved by the City. Any modifications should preserve the landscaped and tree-lined character of the streets. The Zoning Ordinance requires a 50 foot greenbelt along designated streets, and 75 feet along Route 199. This standard has been applied successfully to designated streets bordering Holly Hills, Holly Hills Carriage Homes, Richmond Hill, The Oaks, Brandywyne, Spring Arbor Assisted Living Facility, Queen Mary's Port, and ~~will be applied to the new~~ to the Quarterpath at Williamsburg development.

Approximately 13 miles of greenbelts are identified on Map 13-4 Greenbelts, and are described below:

- **Monticello Avenue** -- north and south sides of the street from Ironbound Road to Treyburn Drive
- **Jamestown Road** -- north side of the road between the Citizen and Farmers Bank and Campus Drive - south side of the road from Route 199 to Lake Matoaka
- **Bypass Road** -- north and south sides of the street from Route 132 to Capitol Landing Road
- **Capitol Landing Road** -- both sides of the street from Queens Creek to just beyond the Merrimac Trail intersection
- **Route 199** -- north side of the street from the City Water Tower to the Route 60 East/Route 199 interchange
- **North Henry Street** --both sides of the street at the City Line from Bypass Road to the CSX railroad
- **South Henry Street** --both sides of the street from Route 199 to Mimosa Drive
- **Merrimac Trail** -- east side of the road from just south of Capitol Landing Road to the Virginia Power Easement
- **Strawberry Plains Road** -- east side of the road from John Tyler Highway to the Strawberry Plains Planning Area boundary (except for the Mt. Pleasant Professional Center)



Greenbelts will continue to play a prominent role in preserving community character, since they are located along important entrance corridors and connecting thoroughfares, as well as adjacent to major economic development areas. By protecting greenbelts, the City will ensure that the aesthetic form and function of these important corridors are preserved.

SHORELINE ACCESS

The City has reviewed the Hampton Roads Shoreline Erosion and Public Access Study as part of the development of the Comprehensive Plan. The only access area identified in the study is along Queens Creek, and a portion of Queens Creek is planned to be incorporated into the Capitol Landing Passive Park. Other shoreline access opportunities in the City include the existing College Landing and Waller Mill Parks, the proposed Papermill Creek and College Creek Passive Parks, as well as the College Creek Nature Area. All of these parks are discussed in the Parks and Recreation section of *Chapter 10 – Parks & Recreation*. Even when not accessible through park land, the shorelines in the City are protected through the Chesapeake Bay Preservation and Floodplain regulations in the Zoning Ordinance.

STORMWATER MANAGEMENT

Almost all site development projects affect storm or surface runoff in some way as they typically result in changes to the surface character of the site, which alter runoff patterns in terms of rate, volume and direction. Construction activities can also generate sediment and nutrient loading issues, and impervious pavements increase both the volume of stormwater runoff and the magnitude of peak flood flows. Furthermore, runoff from urban areas is often polluted with nutrients, oils and toxic metals. The contemporary approach is to develop a comprehensive, integrated stormwater management program which addresses the effects of storm runoff on water quality in addition to volume and rate of runoff.

Water Quality Issues. Best Management Practices (BMPs) are a major component in stormwater management practices, and are measures that have been developed to control, store and/or treat stormwater runoff from developed areas for the purpose of reducing flooding or removing pollutants while maintaining or enhancing environmental quality. BMPs have been incorporated throughout the City as a principal measure in the City's stormwater management strategy. Their effectiveness depends on the removal mechanism used, the fraction of the annual runoff that is effectively treated and the nature of the pollutant being removed. With thoughtful site design, regular maintenance and creative landscape architecture, most BMPs can be not only efficient and utilitarian, but also an attractive (or at least unobtrusive) addition to any community.

Water Quantity Issues. As land is developed, the area of imperviousness almost always increases. If measures are not taken during the design of stormwater management facilities, this increased rate of flow and volume can cause downstream flooding and erosion and sedimentation problems. The use of properly designed stormwater management facilities can provide a solution to these problems. The City's Erosion and Sedimentation Control Ordinance and Stormwater Management Ordinance addresses these issues, and requires all developers to convey runoff to adequate channels, or to prevent an increase of runoff from their properties.

Watershed Delineation. For planning purposes, the City of Williamsburg can be broken into six major watersheds. Four of these watersheds lie within the James River Basin (Chisel Run, College Creek, Paper Mill Creek and Tutter's Neck), while the other two watersheds (Queen's Creek and Waller Mill Pond) contribute to the York River basin. Overall, Williamsburg is located on a ridge with 1,333 acres in the City located in the York River watershed and 4,457 acres located in the James River watershed.

Stormwater Management Plan. The City's Comprehensive Stormwater Management Plan, adopted in 1996, ~~and~~ amended in 1998, and revised in 2014 defined a comprehensive approach to managing stormwater runoff. This Plan provided a comprehensive and unified framework for stormwater management that addressed water quantity and water quality issues and offered detailed recommendations for the proper implementation of Best Management Practices. The major components of this plan are:

Emphasize Regional BMPs. In many cases, regional City-owned BMPs are preferable to small, on-site facilities. Large BMPs serve a larger drainage area and are usually more cost effective to construct and maintain than several smaller on-site BMPs. They also have greater potential to control downstream flooding and other water quantity problems caused by development. To limit the number of small on-site BMPs, the Stormwater Management Plan ~~requires~~ encourages a development to utilize a regional facility if it cannot be served by a BMP facility such as a retention pond that has a drainage area of 10 or more acres or a detention facility that has a drainage area of 24 acres or more. The construction of regional facilities will depend largely on the pace and scale of future development.

~~Establish~~ Regional Reserve Open Space. An alternative to the structural regional BMP is the ~~establishment~~ use of Regional Reserve Open Space. This concept, approved by the Chesapeake Bay Local Assistance Board, allows the City to place restrictive covenants on open space that is purchased for preservation and passive open space. Since this land cannot be developed, the land area can be used to offset impervious land area in proposed developments. This has the dual advantage of encouraging the purchase and preservation of passive open space while reducing the need for small, on-site stormwater management facilities. Two Regional Reserve Open Space areas have been established: the ~~College Creek~~ Richneck Conservation Area and the Papermill Creek Conservation Areas (future site of the Papermill Creek Park). These are shown on Map 6-4: Stormwater Management Facilities.

Maintain a regional BMP credit system. The City has adopted a system, endorsed by the State's Chesapeake Bay Local Assistance Department, which allows the sale of BMP credits to qualifying developers. For instance, instead of building a small on-site facility, the developer could "buy-in" to a regional facility or regional reserve open space if available. The key to this arrangement is that a regional facility or regional reserve open space must exist and must have excess credits available for sale. The advantages of such an arrangement to the developer are that he does not have to reserve land for an on-site facility, nor be committed to long-term maintenance requirements. The advantages to the City are fewer facilities to monitor and inspect, with improvement to overall stormwater quality and aesthetic improvements. The City maintains three regional BMPs: Skipwith Pond and Strawberry Plains detention facility in the James River watershed, and Haynes Pond in the York River watershed. The City sells credits from two of these facilities which are Skipwith Pond and Haynes Pond. Two Regional Reserve Open Space areas have also been established, both located in the James River watershed: the Rich Neck Conservation Area (105 acres) and the Papermill Creek Conservation Area (37 acres - future site of the Papermill Creek Park). Credits from the reserved open space are allowed only for green field development and not for redevelopment.

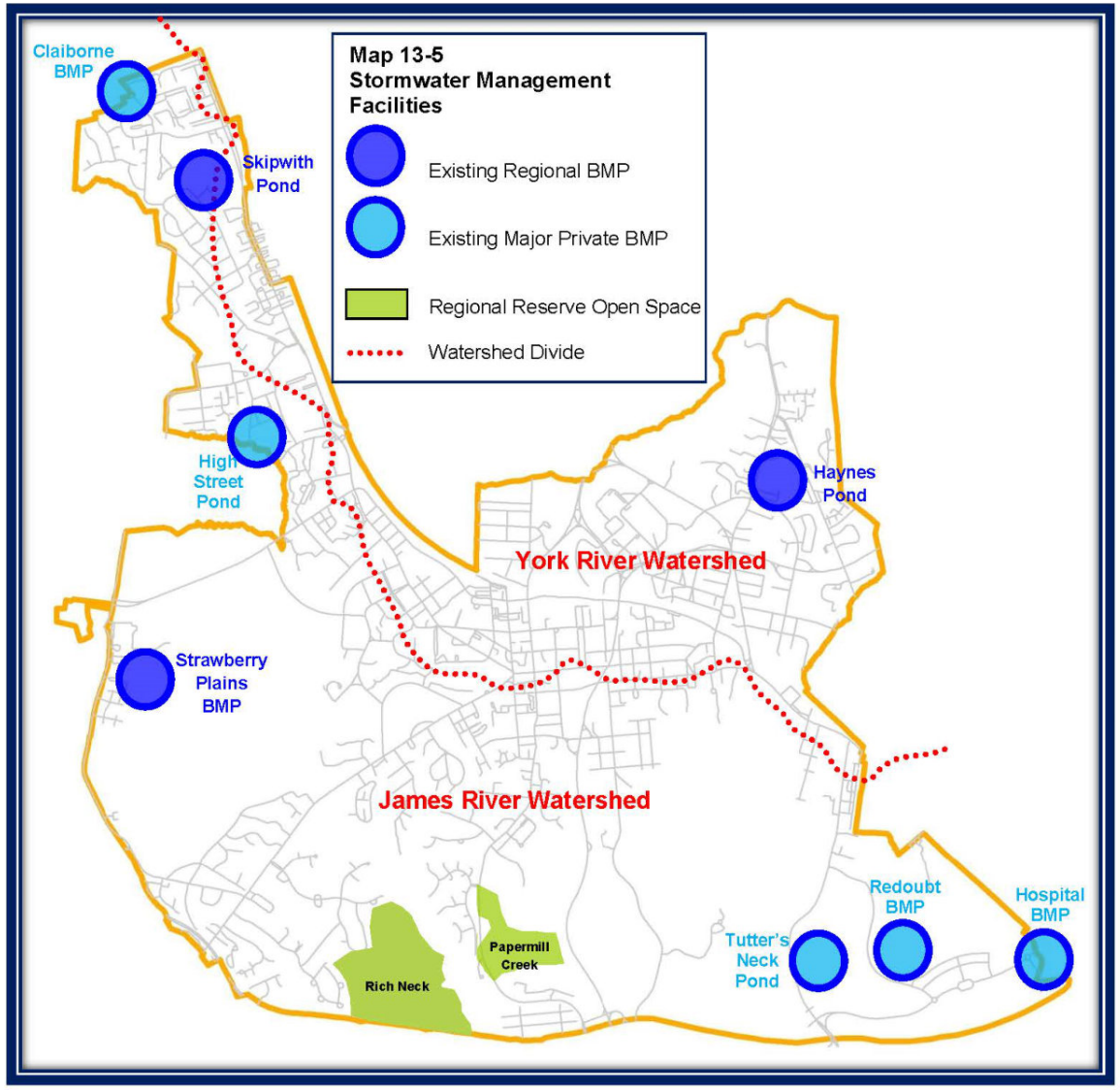
Administer a Stormwater Management Facility Inspection Program. BMPs require regular maintenance to ensure that the facilities operate properly, and the City requires a maintenance agreement from the owners of private BMP structures to ensure that they are properly maintained. The City inspects all private and public BMP ~~structures~~ facilities as part of the MS4 permit requirements ~~that have a maintenance agreement~~. Maintenance guidelines for BMP facilities are presented in the *Williamsburg Stormwater Design Manual* that was developed concurrently with the Stormwater Management Plan.

Administer a Stormwater Management Ordinance. The City has adopted a stormwater management ordinance to augment the existing Chesapeake Bay Preservation and Erosion and Sedimentation Control Ordinances. These regulations are designed to help prevent illicit discharges and dumping into storm drains, and grant the City the legal tools to implement the strategies outlined in the Comprehensive Stormwater Management Plan. These tools include the prohibition by law of putting any gasoline, oil, antifreeze or other pollutants into the storm system. It also prohibits anyone from putting anything in the gutter, ditch, storm drain or other drainage way that impedes or interferes with the free flow of stormwater. Chlorinated swimming pool water also cannot be discharged into the City storm drain system. The ordinance also implements the credit system allowing the sale of water quality credits, thereby providing developers a means to share in the cost of regional stormwater management facilities. This also provides the framework for inspection of BMP's under construction and maintenance requirements for the life of the BMP. This ordinance ~~must be~~ was updated ~~and adopted by July 1,~~ in 2014, ~~and~~ to meet more stringent water quality standards ~~need to be included~~ for new development and redevelopment to enhance Chesapeake Bay restoration efforts.

Phase II EPA Stormwater Regulations. In 2003, the City obtained a permit for municipal stormwater discharges under the State's VPDES General Permit for Small Municipal Separate Storm Sewer Systems (MS-4 Permit). This was required by the Federal Clean Water Act for jurisdictions having a population over 10,,000 located in an urbanized area as defined by the U.S. Census. Six minimum control measures needed to be satisfied: public education and outreach on stormwater impacts, public involvement and participation, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management in new development and redevelopment, and pollution prevention and good housekeeping measures for municipal operations. The City's Stormwater Management Ordinance that was adopted in 1996, ~~and~~ amended in 1998, ~~and~~ 2008 and 2014 was a major factor helping the City to meet these requirements. The MS-4 Permit will need to be renewed in 2023, and it ~~must~~ will include in the final phase of the program strategies to meet the EPA's mandated Chesapeake Bay TMDL (total maximum daily load), by authority of the Clean Water Act. The City must reduce nitrogen, phosphorus, and sediment loads that are delivered to the Chesapeake Bay in drainage water that flows from the City. Strategies that can be utilized to meet these requirements include:

- Retrofit when possible to provide treatment of runoff from existing development
- Reduce runoff volumes by reducing impervious areas, such as by using porous surfaces for parking areas
- Use nutrient management plans, including the state imposed phosphorus ban on fertilizers
- Eliminate septic systems
- Increase street sweeping
- Encourage tree protection and land use conversion by reforestation
- Enforce 30% slope restrictions
- Protect wetlands
- Implement SSO (sanitary sewer overflow) improvements that rehabilitate the City's sanitary sewer system to reduce spills and overflows into state waters

Capital Improvement Programming. In addition to these major policy recommendations, the Stormwater Management Plan included ~~21~~ 14 specific recommendations targeted for inclusion in the City's Capital Improvement Program (CIP). The project selection criteria used to evaluate the recommended projects were based on the following items: safety, quality and quantity benefits and beautification. As of Fall 2018, 2 of the 14 recommendations have been completed with additional work on a third. ~~Two of the remaining six projects are in the planning stage, and the other four have been determined as not feasible. In addition to the 21 original recommendations, 14 additional stormwater management improvements have been completed, and six more have been included in the CIP.~~


Map 13-5
Stormwater Management
Facilities
Existing Regional BMP
Existing Major Private BMP
Regional Reserve Open Space
Watershed Divide
Claiborne BMP
Skipwith Pond
High Street Pond
Haynes Pond
York River Watershed
Strawberry Plains BMP
James River Watershed
Rich Neck
Papermill Creek
Tutter's Neck Pond
Redoubt BMP
Hospital BMP